

Guar Research Efforts at Clovis, NM

A photograph of a field of guar plants. The plants are green with trifoliate leaves and several tall, thin stems topped with clusters of small, light pink flowers. The background is slightly blurred, showing more of the same plants.

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Outline

- **Introduction**
- **Previous Research**
- **Future Plan**

Annual Average Precipitation

United States of America

Ogallala Aquifer

Clovis, NM
(425 mm)

Legend (inches)

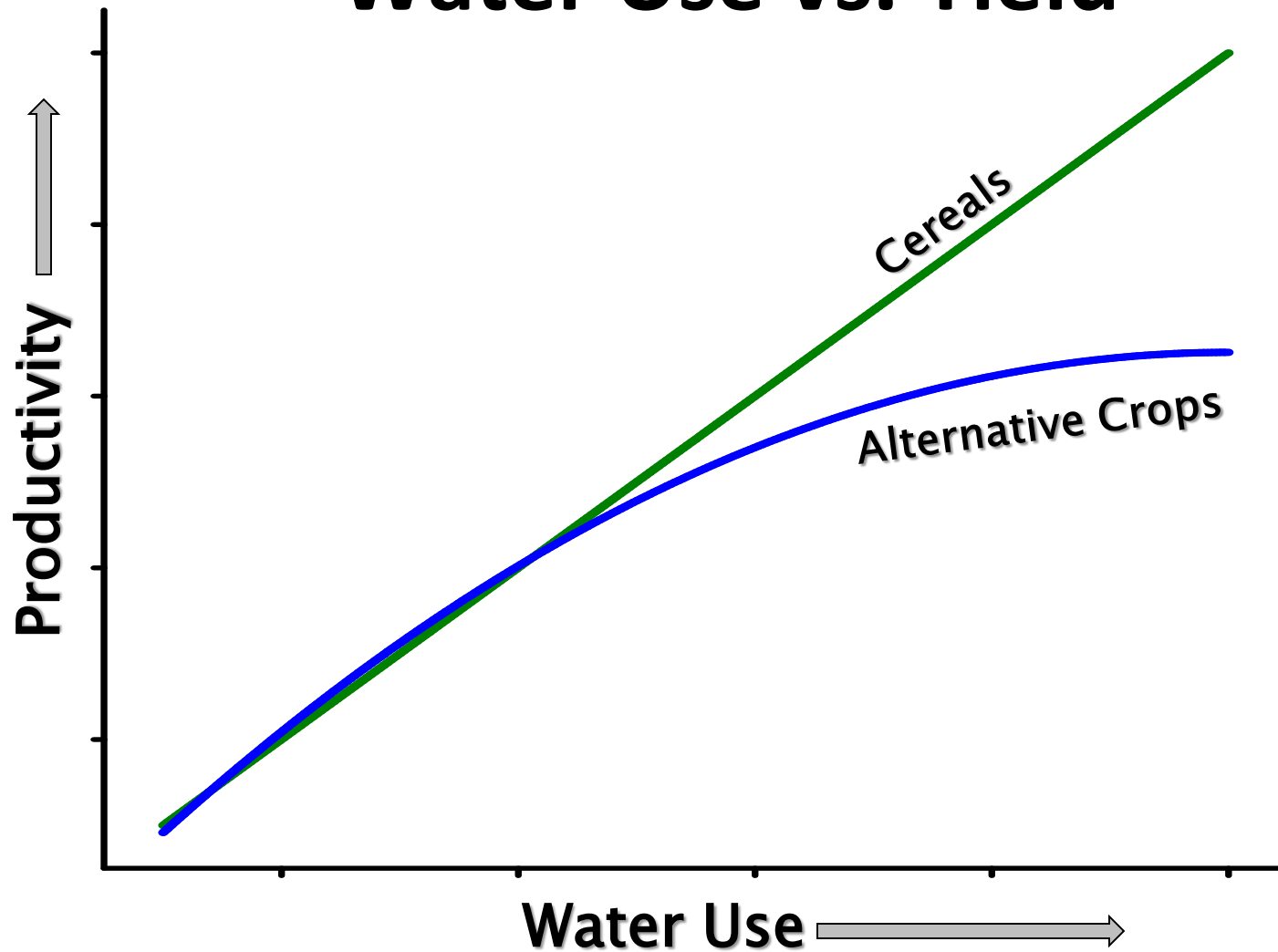
Less than 5	40 to 50
5 to 10	50 to 60
10 to 15	60 to 70
15 to 20	70 to 80
20 to 25	80 to 100
25 to 30	100 to 140
30 to 35	140 to 180
35 to 40	More than 180

Period: 1961-1990

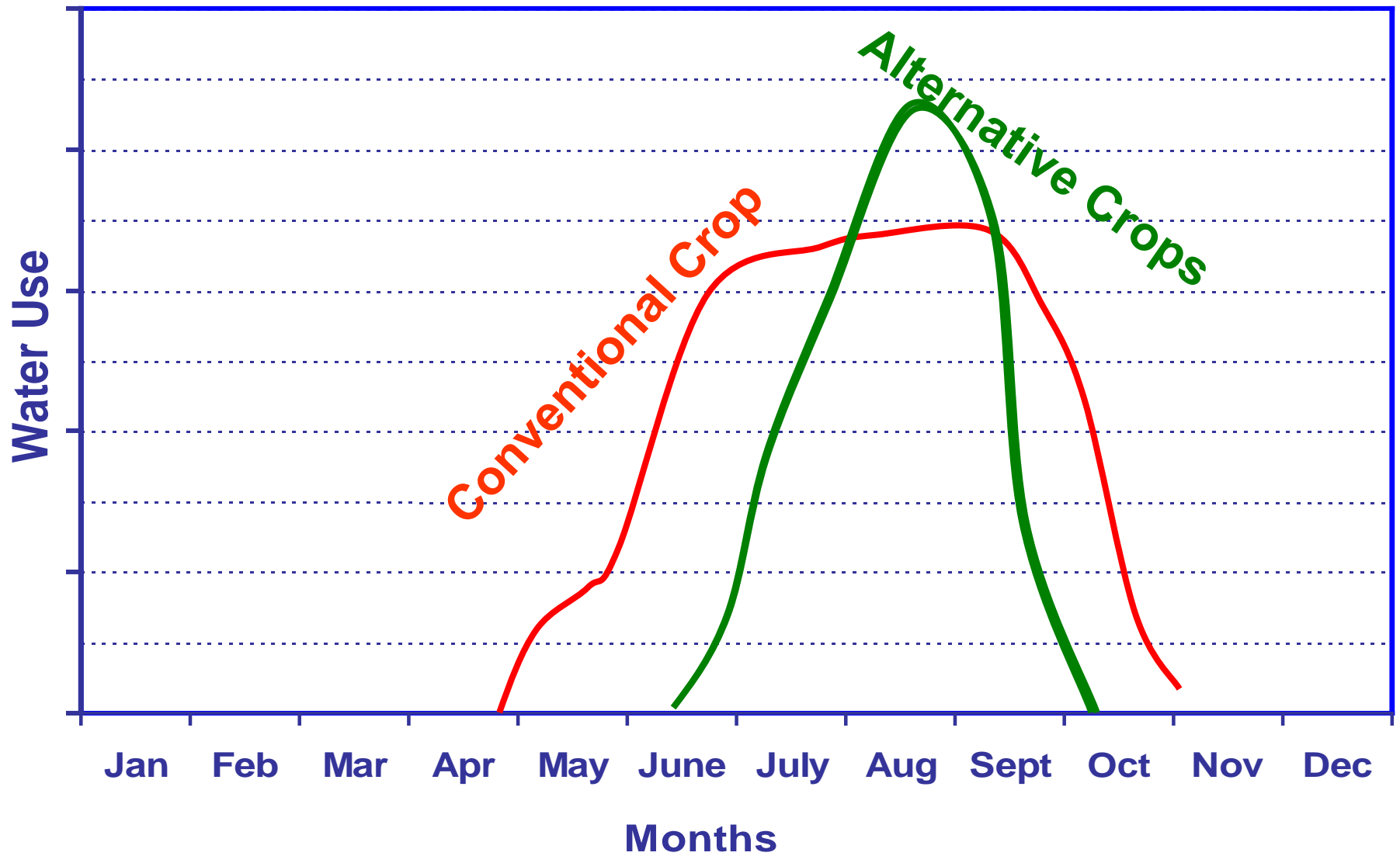
Modeling performed by Christopher Daly using the PRISM model, based on 1961-1990 normals from NOAA Cooperative stations and NRCS SNOTEL sites. Sponsored by USDA-NRCS Water and Climate Center, Portland, Oregon.

Oregon Climate Service
George Taylor, State Climatologist
(541) 737-5705

Water Use vs. Yield



Alternative Crops



First Guar Project: Deficit Irrigation Management 2013



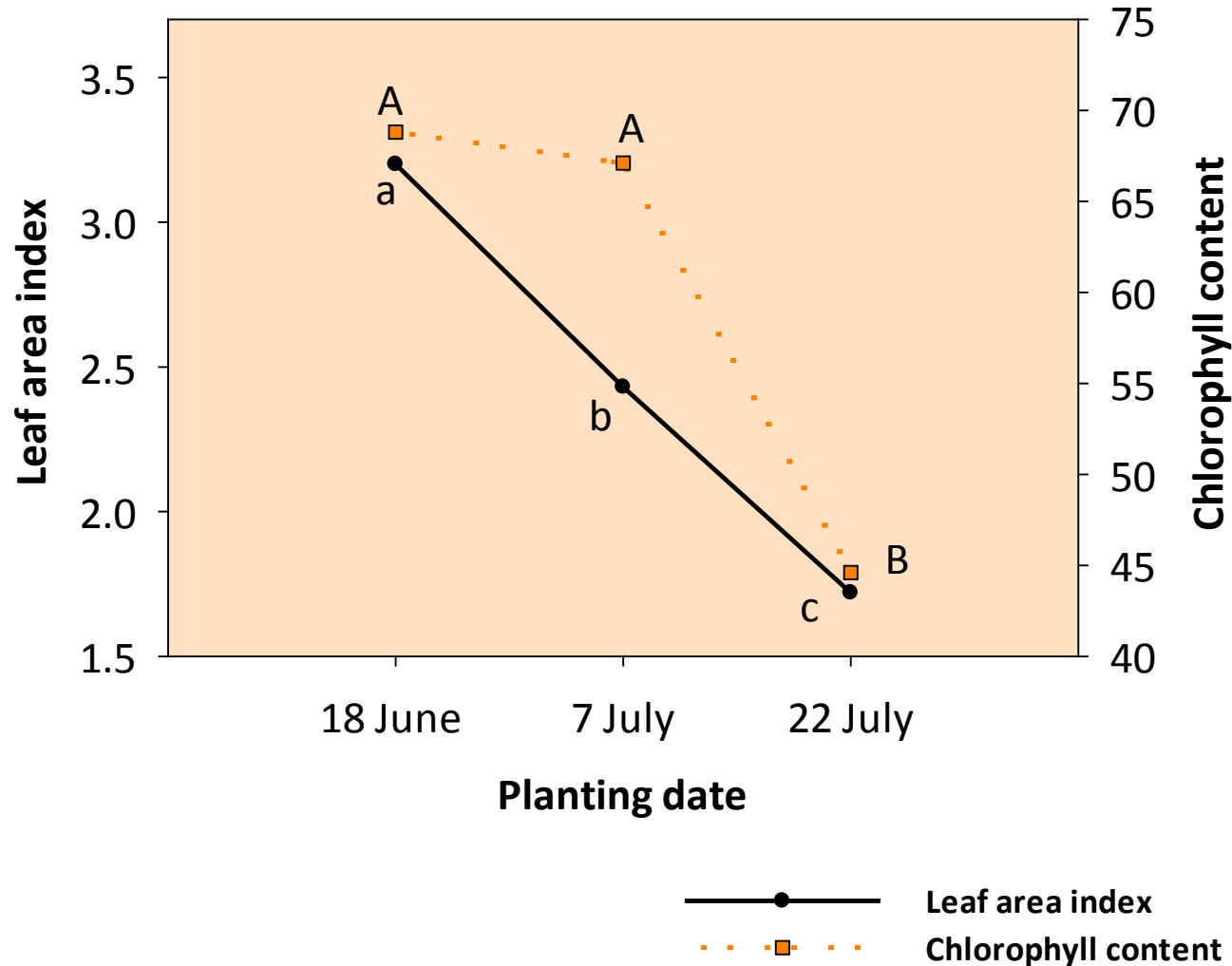
Herbicide drift damaged the trial.

Second Guar Project: Seeding Date Study 2014-15



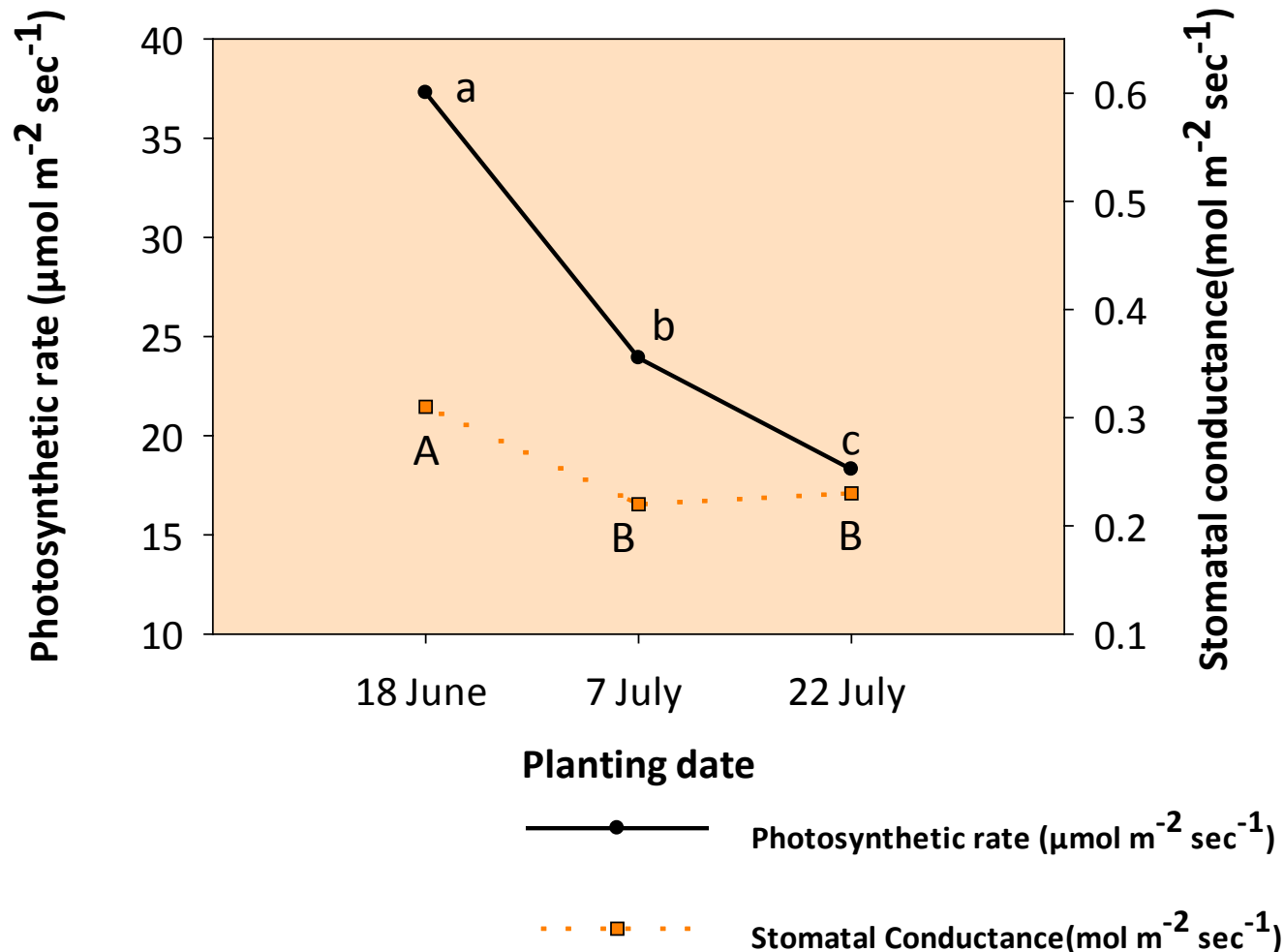
Sudhir Singla, MS Student

Figure 2.1 Effect of different planting dates on leaf area index and chlorophyll content of various guar genotypes at 50% flowering stage at Clovis, NM in 2014.



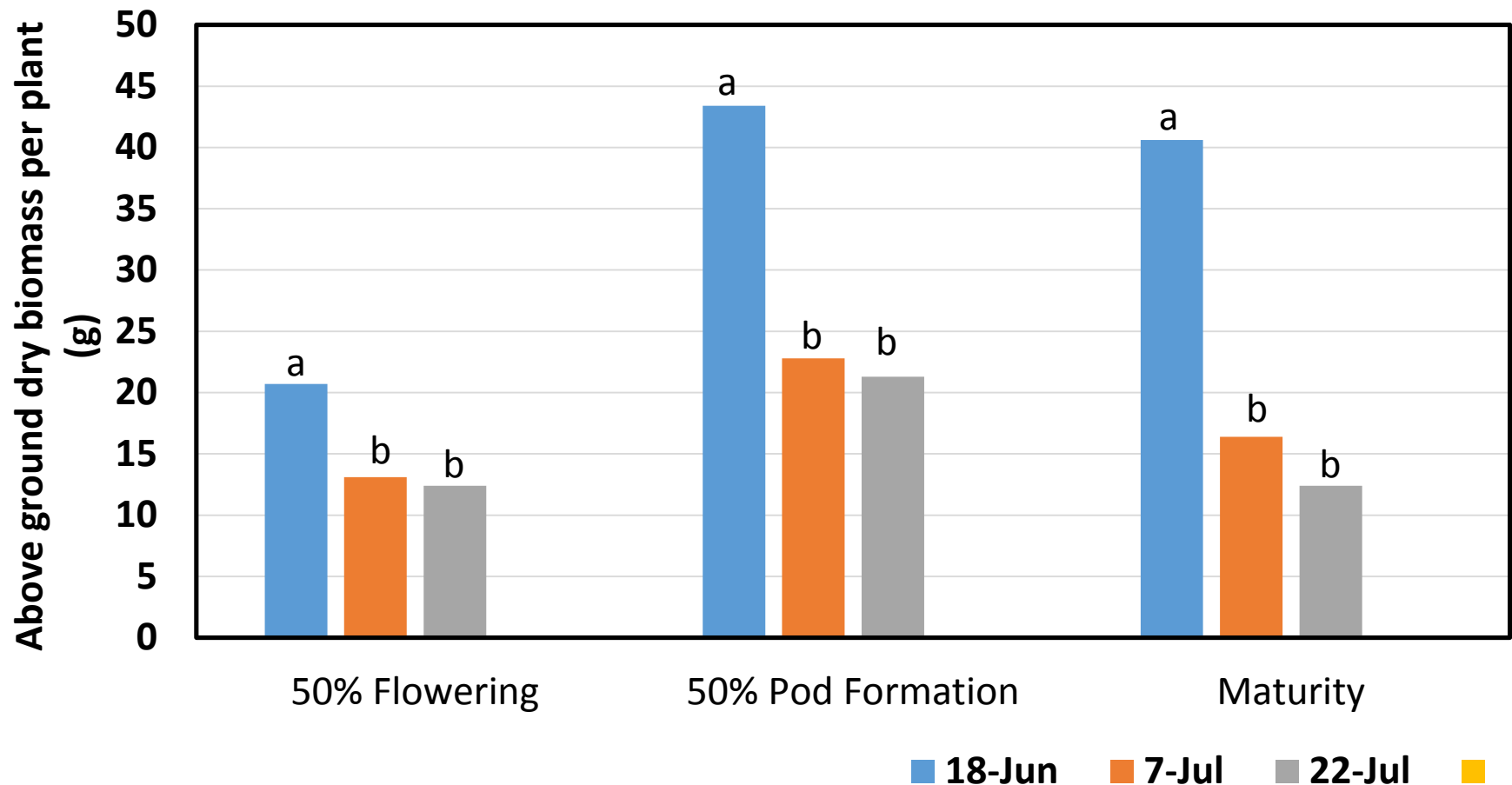
Values with the same letter within one variable are not statistically different according to Fisher's LSD test at $\alpha = 0.05$

Figure 2.2 Effect of different planting dates on photosynthetic rate and stomatal conductance of various guar genotypes at **50% flowering stage** at Clovis, NM in 2014.



Values with the same letter within one variable are not statistically different according to Fisher's LSD test at $\alpha = 0.05$

Figure 2.3 Effect of different planting dates on above ground dry biomass of various guar genotypes at 3 growth stages at Clovis, NM in 2014.



Values with the same letter within a growth stage are not statistically different according to Fisher's LSD test at $\alpha = 0.05$

Results: yield and yield characters

Clovis, 2014

Table 2.4 Effect of different planting dates on pod thickness, seeds per plant, clusters per plant, pods per plant, harvest index and seed yield of various guar genotypes at maturity at Clovis, NM in 2014.

Planting Date	Pod thickness (mm)	seeds per plant	Clusters per plant	Pods per plant	1000 seed weight (g)	Harvest index	Seed yield (kg ha ⁻¹)
18 June	3.8a	329.3a	13.7a	62.7a	30.7a	0.35a	1399a
7 July	2.4b	213.5b	11.1b	43.3b	21.8b	0.31ab	1111b
22 July	1.4c	57.2c	7.5c	28.2b	18.9b	0.26b	903b
Genotype							
HES 1123	2.2b	231.4a	12.0a	46.3a	22.0b	0.32ab	1128a
Kinman	2.5b	129.0b	7.8b	34.9a	20.4b	0.29b	1144a
Lewis	3.0a	231.7a	11.5a	49.3a	22.2b	0.33a	1162a
Matador	2.5b	207.9a	11.7a	48.5a	30.6a	0.29b	1117a
Planting Date × Genotype	NS	NS	NS	NS	NS	NS	NS

[†] Values with the same letter within a column are not statistically different according to Fisher's LSD test at $\alpha = 0.05$

NS - Non-significant at $P \leq 0.05$

Hailstorm Damage at Clovis

- Ruined first two plantings on June 16, 2014

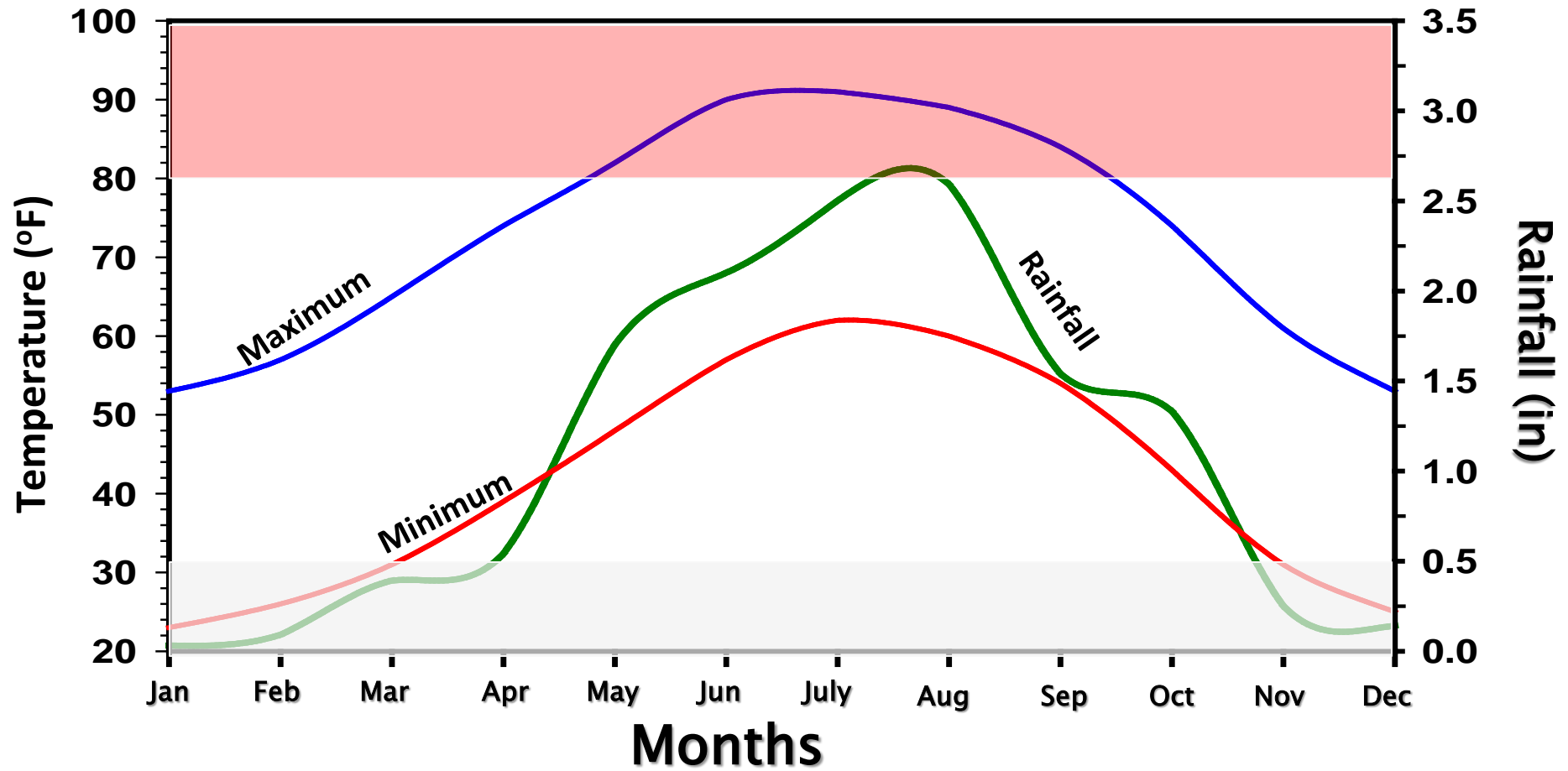


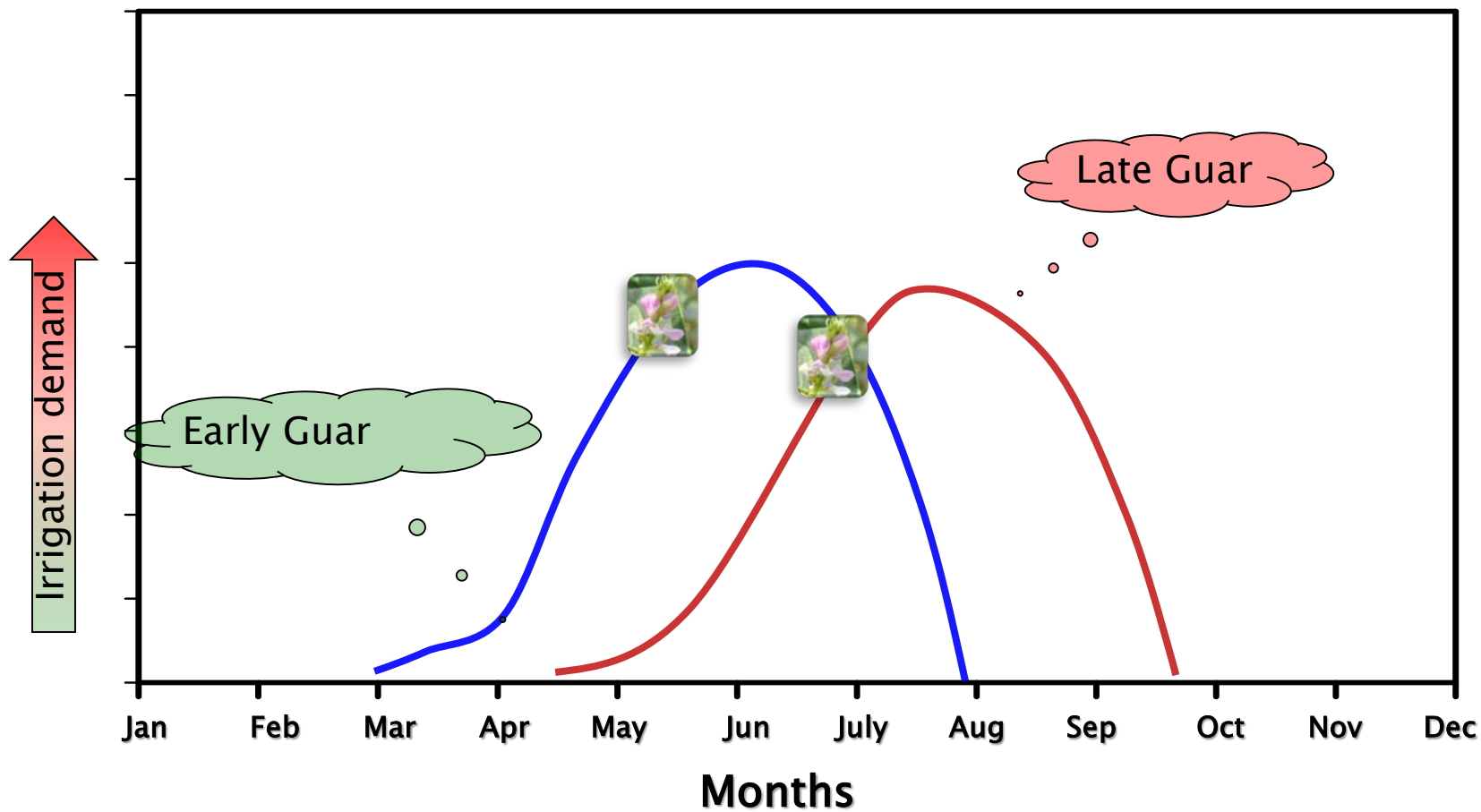
Summary

- Optimum planting dates for guar was around middle of June in the area.
- Seed yield of guar starts declining with delay in planting.
- More research on earlier than June middle planting are required.

Future Plans

When to Plant



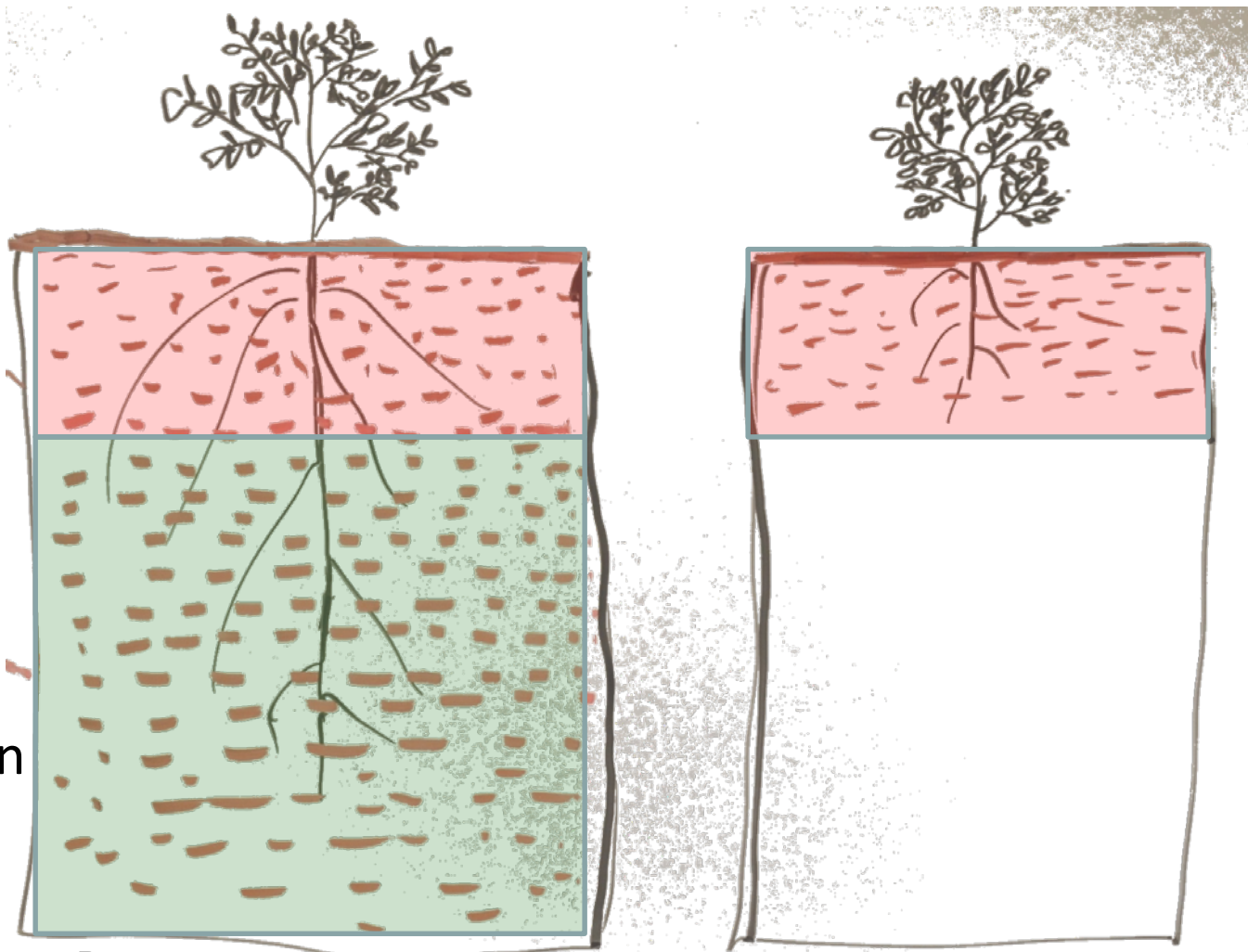


Guar: Deficit Irrigation Management



Pivot
Irrigation

Pre-
Irrigation



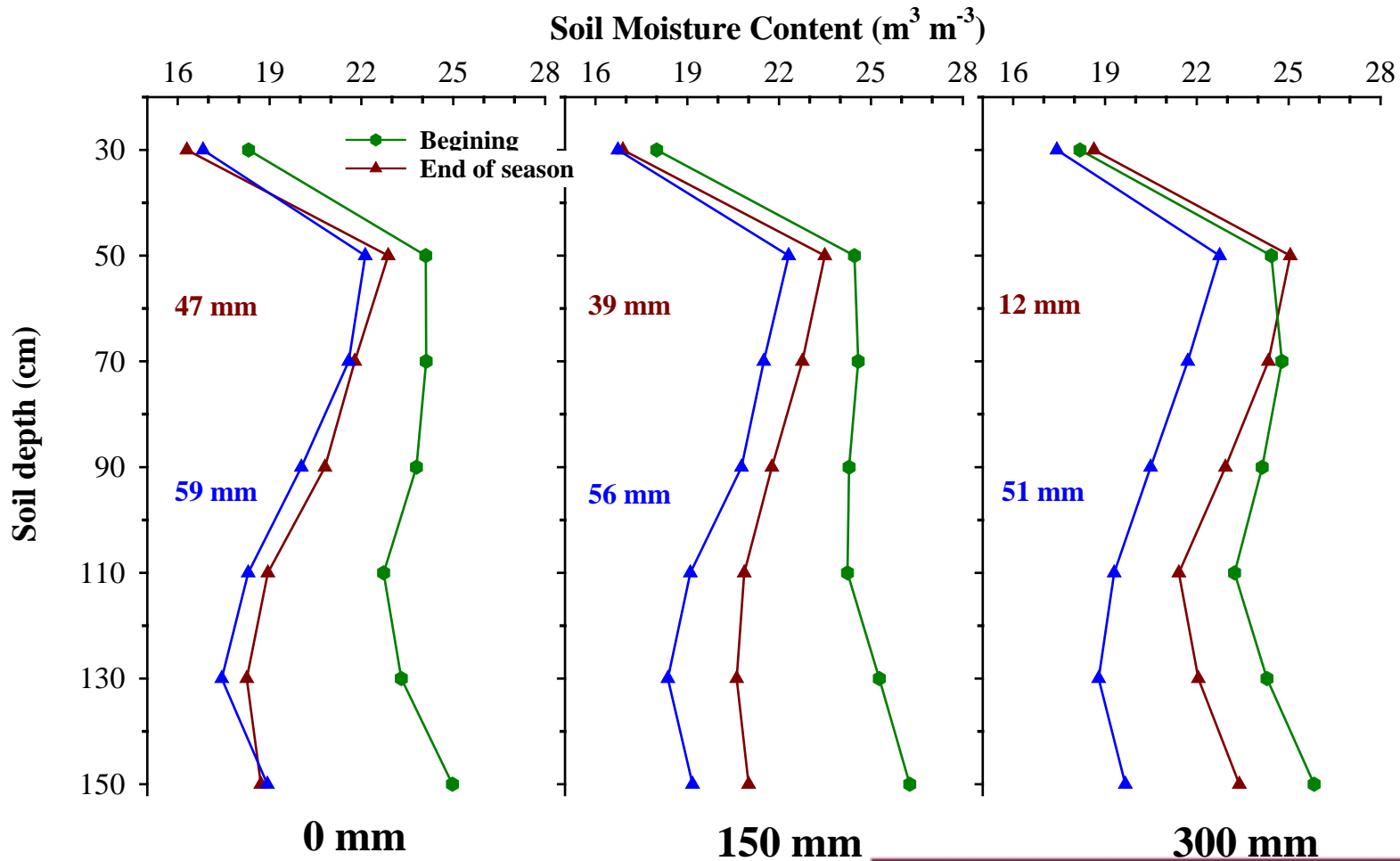
- Deep root system
- Water Extraction Patterns
- Biomass partitioning
- Yield formation

Water Extraction and Yield Formation



Water Extraction

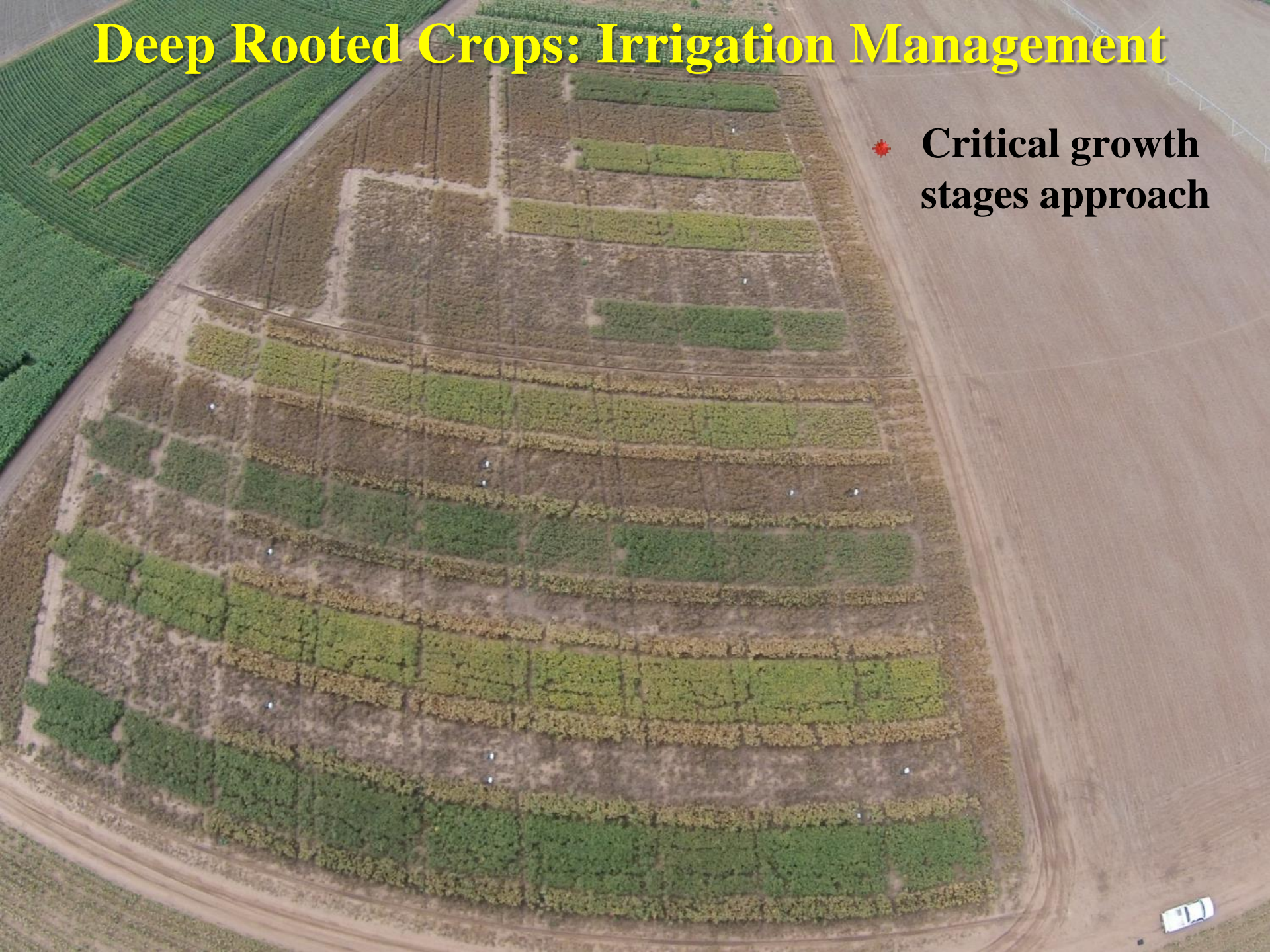
(Winter Canola & Wheat)



(Clovis, 2009)

Deep Rooted Crops: Irrigation Management

✱ Critical growth stages approach



Effect on Seed Quality



A photograph of a lush green field, likely a crop field, with rows of plants. In the background, there are some yellow flowers. A semi-transparent white box with the text 'Thank you' is positioned in the upper right area of the image.

Thank you

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